

# KNOWLEDGE

VOL 1 OCTOBER 2007

OFFICIAL SAFETY MAGAZINE OF THE U.S. ARMY

## AIRCROWS COORDINATE!

p. 5

TEAMWORK SAVING LIVES

➤ **ACT-E UPDATE** p. 14

➤ **VEHICLE CREW COMMO** p. 16

➤ **HAVE A DESIGNATED DRIVER** p. 18



**BATTLE DRILLS**

p. 23

Practice will protect your crew



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OFFICIAL SAFETY MAGAZINE OF THE U.S. ARMY

## contents

- 2 From the DASAF
- 4 From the CSM
- 5 Aircrew Coordination

## 14 ACT-E UPDATE



- 20 Hunting for Trouble
- 22 Honey, Can I do It One More Time?
- 24 Where's the Fire?



WHEN A DESIGNATED DRIVER PLAN FAILS

- 8 Be Ready for Anything
- 10 From the Front Seat
- 13 And the Award Goes To...



## 16 VEHICLE CREW COMMO

- 26 Battle Drills—Another Side of Crew Coordination
- 28 Dressed for Success
- 30 Safety in Numbers
- 32 Accident Briefs

**Plus: pull-out posters**



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# EFFECTIVE COORDINATION BUILD

Here we are in October, revisiting the topic of crew coordination, which we addressed in the February 2007 *Knowledge* under the context of mission preparation. This issue of the magazine further validates the relevance of the subject and goes a step beyond with firsthand accounts of "been there, done that and lived to tell about it." As you read through the articles like the ones from the AH-64D crew on pages 8 through 13, you will pick up on elements of crew coordination that probably seem second nature to you. However, ask yourself if you practice what you were taught, starting with mission preparation, through the after action report and then all the way home.





“Not only is it **BETTER** to **SAY SOMETHING** at the **TIME** when you can **EFFECT** a **POSITIVE CHANGE**, but it is your **RESPONSIBILITY.**”



# E CREW NATION: DING THE TEAM

The numbers speak for themselves. Between fiscal 2003 and August 22, 2007, crew coordination errors contributed to 41 of our 122 aviation accidents. That's far too many when you consider that, in its simplest form, crew coordination is just an extension of the teamwork concept you

learned on Day 1 in the Army. From there, you start adding more battle buddies, vehicles and/or aircraft into the mix. Each factor adds another level of complexity that forces you to distribute the workload, ensure positive and accurate information flow and rely on crew drills and standing operating procedures to make the mission happen safely and successfully.

Along the way, though, you will inevitably realize that keeping the environment open and professional will make all these steps come together a lot more easily. Engaged leaders create the climate that makes that possible and can also foster simultaneous mentorship. Effective crews are comprised of assertive, knowledgeable crewmembers who, regardless of rank, provide

timely input to the vehicle or flight commander in order to help all members understand the conditions, actions and decisions. Accident investigators often find that one of the shortcomings in crew coordination is "excessive professional courtesy" based on either the individual's rank or perceived experience level. Not only is it better to say something at the time when you can effect a positive change, but it is your responsibility.

And your accountability for what did or did not happen extends through the AAR. I firmly believe that constructive feedback allows the individual and crew to improve. It also allows the leadership to better develop tools and training to ensure future success. I like to think successful AARs incorporate brutally honest feedback.

Now how does that translate over to your off-duty activities? Just think about it. Every time you drive with another person and ask them to look for traffic so you can turn, or you have someone read a map so you can focus on driving, you are essentially employing crew coordination.

My goal is that you take what you learned from these articles, your prior training and experiences and apply that combined know-how to ensure effective crew coordination always has a place with your team. Not only will it make a difference in the success of our future missions, it will ensure that **Army Safe is Army Strong!** ◀

**William H. Forrester**  
Brigadier General, USA  
Commanding



# THE KEY TO SUCCESSFUL MISSIONS

**E**ffective crew coordination is the key to successful mission accomplishment.

In my role as Command Sergeant Major of the U.S. Army Combat Readiness/Safety Center, I am afforded many opportunities to interact with Active, Reserve and National Guard Soldiers who comprise our great Army. During my visits with them, I am able to gain insight on just how diverse we are as a warfighting entity. And, while we are diverse in how we accomplish our daily missions, those visits usually include the sharing of our common experiences while operating a vehicle or aircraft.

As crews operate their equipment, they are required to communicate; thus we have crew coordination. Crew coordination is a very familiar term in aviation and armor circles. For years, it has been used to bring a group of individuals together to maneuver a multimillion dollar system and deliver personnel or firepower upon an objective at a decisive moment.

Effective crew coordination cannot be underestimated as a proven safety measure. Next to the individual Soldier, most leaders would contend that communication is the essential key to mission success in any situation. Through effective two-way communication, leaders can maintain situational awareness on

the battlefield, enabling them to recognize the threat their unit faces and the best way to defeat it.

In our business, the ability to communicate effectively, whether through verbal or nonverbal means, is essential to mission accomplishment. Of the two, we are more familiar with verbal; but only through active listening and years of experience is it mastered. Nonverbal communication, another necessity of our profession, is usually dictated by our inability to communicate directly during a situation. This is most commonly due to distance, noise or by choice to maintain the element of surprise. That is the part of nonverbal communication we generally understand. Less understood and even more important to the leader is the ability to read body language and interpret what it means. The ability to read body language and ask the right questions when you sense something wrong could save a Soldier or members of their crew. This fight requires everyone's head in the game when outside the wire.

Coupled with the information provided and keeping safety in mind, the Army is going to great measures to ensure Soldiers at all levels are trained on crew coordination prior to mobilization and deployment. The safe completion of a mission is the only method to

**“NEXT to the individual SOLDIER, most leaders would CONTEND that COMMUNICATION is the essential KEY to MISSION SUCCESS in any situation.”**



gauge and measure our success. That said, we all know that without crew coordination, disaster awaits. There are plenty of statistics showing what happens when crew coordination and communication breaks down.

This leads me to discuss what happens at our home stations. For the most part, we would all agree that we're successful when we deploy and fight. Now, how do we transition that success as we return to home station? A team's ability to pass and receive verbal and nonverbal communication in a concise matter is just as important in a non-deployed environment.

In closing, I issue a challenge to each of you to transition your combat team and crew coordination and communications skills back to garrison. You wouldn't leave them laying there without a fight, so don't do it here either. ◀

*Tod L. Glidewell*

**Tod L. Glidewell**  
Command Sergeant Major  
U.S. Army Combat Readiness/Safety Center

## ARMY SUPERIOR UNIT AWARD PRESENTED

**G**EN Richard A. Cody, vice chief of staff of the Army, presented the Army Superior Unit award to the U.S. Army Combat Readiness/Safety Center on Sept. 19, during the Senior Safety Professional Development Symposium at Fort Rucker, Ala. The USACRC received this recognition from the Secretary of the Army for outstanding meritorious performance from Aug. 17, 2006, through June 15, 2007, as a unit,

in a difficult and challenging mission. This presentation marks the first time the Army Superior Unit award has been presented to an organization with the USACRC's unique safety mission.

The USACRC is the knowledge center for accidental loss in the Army. The organization actively collects all accident information, conducts detailed analysis and provides worldwide communication of Army safety efforts.



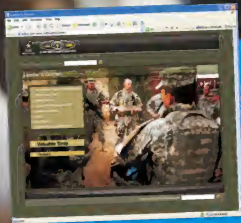
Pictured from left to right are SGM David Griffith, previous USACRC sergeant major; CSM Tod Glidewell, USACRC commanding sergeant major; GEN Cody; and BG Bill Forrester, USACRC commanding general.



# AIRCREW COORDINATION

U.S. ARMY COMBAT READINESS/SAFETY CENTER  
Fort Rucker, Ala.


**A**ircrew coordination, cockpit resource management, cockpit coordination, cockpit communication management ... all these terms refer to the same basic principles of ensuring the sum of the members of an aircraft crew is greater than the individuals themselves. The Army has spent many years developing programs to help aircrews perfect aircrew coordination to prevent accidents and preserve some of the most valuable resources in our Army—the aircraft and, more importantly, the crews who fly them.



## FYI

### Leader's Corner Tool Available

The Leader's Corner Web site has recently been revised to give leaders at every level a single page providing quick and easy access to vital safety information. The site's goal is to help leaders implement composite risk management processes to help keep their Soldiers in the fight and preserve the combat power of their formations. For more information on Leader's Corner, visit the USACRC Web site at <https://crc.army.mil/leaderscorner/> or call 334-255-2381.



We don't know how many accidents these programs have prevented. That's one of the hard parts of the safety business; you can't really tell how many accidents are avoided. We do occasionally get stories from a flight crew like the one highlighted on pages 8 through 13 in this issue of *Knowledge*. The flight crew had complete loss of all tail rotor components in an AH-64D and lived to tell the story. Having listened to the cockpit audio from the maintenance data recorder, I can assure you those two Army Aviators did the rest of us proud throughout the 15 minutes between the onset of the emergency and the safe landing back at their home base. Most of all, they communicated, backed each other up and worked together to get the aircraft on the ground.

Unfortunately, all the efforts put into aircrew coordination training development and the hours put into training aviators at the U.S. Army Aviation Warfighting Center will not prevent crew coordination-related accidents from occurring. Just this fiscal year, the Army has had six crew coordination-related Class A accidents. Some have been similar to the accidents we've

seen for years. Either both pilots were focused inside the cockpit at a critical moment, or the crew was overconfident in the pilot in command's ability to take care of the situation and stopped coordinating. Crews encountering inadvertent instrument meteorological conditions and failing to communicate is another recurring scenario that has led to accidents this year.

Two of these incidents involving crew coordination failures resulted in catastrophic accidents. Aircrew interviews and digital recordings gave us indications that the crews encountered what any aviator would consider worst-case scenarios—engine failures. This placed the crews in extremely difficult situations. In one case, an engine failure in a single-engine aircraft, and in another, a single-engine failure in a multiengine aircraft that was too heavily loaded to maintain altitude. The challenges these crews faced just to minimize the damage were significant; however, evidence indicates that the severity of the accident might have been lessened if the crews had better coordinated their efforts.

In the first case, two pilots in

an OH-58D aircraft experienced an engine failure at terrain flight altitude. All of you who fly Kiowa Warriors know there is no good place for an engine failure. With limited reaction time at low altitudes, engine failures can't get much worse, and in this case, the pilot on the controls hesitated to respond to the failure. The digital collector indicates he misdiagnosed the failure and didn't lower the collective for more than four seconds. Interviews suggest the pilot not on the controls sensed what was happening but said nothing and simply prepared to "ride it in." Again, this was going to be an accident from the time the engine failed, but the crew's injuries might have been less severe if the pilot not on the controls had assisted the pilot on the controls.

In the second case, a multiengine helicopter flying IMC experienced an engine failure. The crew initially responded well to the incident by crew coordinating their immediate action steps. The pilot on the controls announced an airspeed that would have maintained the minimum rate of descent, made their emergency radio call and adjusted the flight controls to achieve that



airspeed. Then something went wrong; neither pilot noticed the airspeed continued to drop until the maximum torque available was reached on the good engine and it no longer had the required power to maintain rotor speed. The circumstances indicate the crew failed to properly divide the duties in the cockpit. The pilot on the controls failed to maintain the briefed airspeed and the pilot not on the controls failed to cross-monitor his performance, thereby resulting in loss of aircraft control and the subsequent crash.

Both of these incidents put aircrews in situations that none of us would ever want to encounter and would likely overtask even the best aviator. However, every aviator must realize that coordination between aircrew members, especially in emergency situations, is critical to minimizing the severity of an accident.

#### **What can your unit do?**

- Ensure all aircrew members are trained and evaluated on the most current Aircrew Coordination Training - Enhanced programs available for your aircraft. For updates, call the USAAWC's

“**CREWS** encountering **INADVERTENT** instrument meteorological conditions and **FAILING TO COMMUNICATE** is another recurring scenario that has **LED** to **ACCIDENTS** this year.”

Directorate of Training and Doctrine at (334) 255-9680.

- Conduct crew and passenger briefings religiously and meticulously using a leader-approved checklist as part of a standing operating procedure. Brief the actions and responsibilities of all aircrew members beforehand, so if an emergency does occur, there is a plan in place instead of trying to “make it up as you go.”

- Ensure team rehearsals are conducted BEFORE mission execution with emphasis on crew coordination, duties and

responsibilities. Plan for the worst scenario, especially if the aircraft is “hot and heavy” or the weather is marginal.

- Emphasize to aircrews the importance of continuing to “fly the aircraft,” asking for assistance, offering assistance and continuing to communicate, especially when things start to go bad.

- Conduct after-action reviews or debriefs after the mission and discuss crew coordination successes and deficiencies and how to improve.◀

# BE READY FOR ANYTHING

CW3 JESSIE SCRUGGS  
Arizona Army National Guard

**R**ecently, two crewmembers survived a catastrophic accident when they skillfully landed their AH-64D after it lost all tail rotor components. In the following pages, you'll read the first-person accounts of both crewmembers written only hours after the incident. We are publishing their stories here with their permission and approval, and we're grateful to them for sharing their experience.

When our unit was preparing for deployment to Afghanistan, our standardization pilot prioritized our threats: the environment, the aircraft and the enemy. We were close to the halfway point of our unit's deployment and had already dealt with the threat from the mountains and the Taliban. Today, it was the aircraft's turn.

## The mission

The day's mission was to provide an AH-64D escort for a UH-60 that was flying to selected forward operating bases to pick up wounded enemy prisoners of war and bring them to our location, FOB Salerno. It was a quiet Sunday morning. The weather was great, and I was teamed up with a strong

pilot in the front seat. I was in the backseat serving as the pilot in command. We anticipated an enjoyable flight.

We'd executed our mission and our flight of two aircraft was headed back to FOB Salerno. We were Chalk 2 behind the Dustoff, and my front seater was on the controls. About 15 miles from the FOB, the aircraft

experienced a loud "banging" sound and lurched upward about 10 feet. Initially, I thought we had passed through a pocket of moderate to severe turbulence, or had taken a hit with a rocket propelled grenade. The aircraft settled back into flight with the nose about 20 degrees to the right and tucked down about 10 to 15 degrees. I asked the pilot to "hold what she had" while I looked at the instruments. There were no warning, caution or advisory lights illuminated in the cockpit. All indications were normal, except





**F**

the left pedal went to the floor without any aircraft response.

We transferred the controls and I asked the Dustoff bird to circle back and take a look at our tail rotor. We knew we had a tail rotor malfunction, but we didn't know the extent of it. Dustoff called us with news no helicopter pilot wants to hear, "Butcher 23, it looks like your tail rotor is totally gone and half of your stabilator is missing."

### Our actions

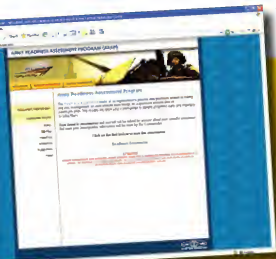
Our initial reaction was to continue to fly the aircraft to an area where a roll-on landing could be executed. We had a couple of things going for us. The first thing was we had about 300 feet of altitude and 120 knots airspeed. We had also just cleared the last major mountain pass between us and a runway. The aircraft was flying fine.

With the nose to the right and tucked down, the attitude was unusual but manageable. We

cleared the mountains and entered the "bowl" leading to FOB Salerno. We backed up our actions with the checklist, using a loss of tail rotor thrust with continued flight being possible. The change in the center of gravity was very noticeable because there was only an inch or so aft cyclic available while in level flight. The only step in the checklist we debated was whether to jettison the rocket pods. We made the decision not to jettison because we were able to continue

flying and were over a populated area. Looking back, the decision to not jettison the rocket pods proved one of the best decisions we made. How the pods helped us will be explained later in this story. We called the tower and declared an emergency and our intent to perform a roll-on landing.

We maintained our airspeed until reaching the gravel runway at Salerno. The plan was to get the aircraft 5 to 10 feet above the runway while maintaining a



**Have you measured your formation's safety climate through the Army Readiness Assessment Program? It's a Web-based initiative that provides battalion-level commanders with data on their formation's safety climate. Check it out today at <https://unitready.army.mil/>.**

90-knot airspeed as we conducted a roll-on landing. The front seater would operate the power levers to maintain directional control and I would focus solely on flying the aircraft.

On the initial approach, I couldn't get the aircraft's nose where I thought it needed to be to safely accomplish a roll-on landing. As a traditional

guardsman, I work as a full-time pilot for a governmental agency and have attended annual refresher courses that go into extensive detail on tail rotor malfunctions. The most important thing stressed during the training was to fly the aircraft and not accept a less than ideal landing situation unless absolutely necessary. By the time I

**“DUSTOFF called us with NEWS no helicopter pilot wants to HEAR, ‘Butcher 23, it looks like your TAIL ROTOR is TOTALLY GONE and HALF of your STABILATOR IS MISSING.’”**

was happy with directional control, we had eaten up about half of the short, gravel runway and didn't have enough room for

a safe landing. With the aircraft still in a stable flight profile, I made the decision to go around. I knew the go-around

# FROM THE FRONT S

**M**ay 31, 2007, started like any other day on Quick Reaction Force duty. We had just completed preflighting our aircraft when the call came in. It was a nine line MEDEVAC chase for an urgent pickup of wounded enemy prisoners of war. This was just another day of escorting MEDEVAC birds across Afghanistan.

We were off the ground in less than 10 minutes. It was a 45-minute flight to the forward operating base holding the EPW patient. We made our way through mountain passes to the patient's location without incident. We had just picked up our first patient when we received a second nine line for an additional EPW at a FOB about 30 minutes from our home base. Not a problem. We swung by and picked up the second patient and headed home.

We were 12 nautical miles from FOB Salerno, descending out of the mountains and into the Khowst bowl. Our airspeed was at a typical AH-64D "sprint"—somewhere between 120 and 130 knots true airspeed. We were following our MEDEVAC brothers when we heard a loud "WHAM" and the aircraft yawed hard right and

began slipping left. It initially felt as though we had hit severe turbulence, but the aircraft attitude didn't correct itself, despite the application of full left pedal. It was a dead giveaway that we had a tail rotor malfunction of some kind. The pilot in command calmly told me, "Hold what you got, the aircraft is still flying."

We called the MEDEVAC bird and asked them to take a look at our tail and find out what was going on back there. Knowing we had a tail rotor malfunction to contend with, we pulled out the checklist and began reading through the emergency procedures for "Loss of Tail Rotor Thrust in Cruise Flight—Continued Flight Possibility."

The MEDEVAC UH-60 reported the unthinkable—the tail rotor was completely missing, as well as half our horizontal stabilator. This wasn't exactly what we wanted to hear; however, it didn't change the fact we had to deal with the following EPs.

**1. Airspeed:** A minimum of 90 KTAS (until 10 to 20 feet above touchdown). Not a problem, we were maintaining about 100 to 110 KTAS without descending. We could make it back to FOB Salerno as long as we held what we had.

**2. Wing Stores:** Jettison as appropriate. Did we want to jettison? No—there wasn't any need for discussion. Once again, we decided to hold what we had because it was working for us. Everything was controlled at this point; punching off our left and/or right rocket pods was an unknown. The aircraft's right yaw was uncomfortable, but controllable.

**3. Power Levers:** Retard as necessary (5 to 10 feet above touchdown). The backseater would remain on the controls throughout the approach while the front seater assisted by manipulating the power levers. As we neared 5 to 10 feet above ground during our approach, the aircraft started turning right, so we began pulling back the power levers as necessary to maintain lane alignment.

The odds were against us, but neither of us said anything. We locked our shoulder harnesses and lowered the seat in the front cockpit, knowing the main rotor had a tendency to violate the front seater's head space during a crash sequence.

We approached FOB Salerno on an extended final for Runway 90. As we made our approach, we experimented with the power settings to determine which one

wouldn't be a pleasant experience, but it would be controllable.

On the second attempt, we had all the information we needed to conduct a safe roll-on landing. We knew how the aircraft was going to react to ground effect with 90-plus knots of airspeed. More importantly, we knew at what airspeed and power setting the nose

was going to align with the runway. Having this information, we refined our plans. I now knew the speed we had to be at when we came over the approach end of the runway.

We executed the go-around without incident, making a wide, easy turn to the right and accepting the nose-right and tucked attitude. We lined up

on final and executed a shallow approach to a roll-on landing. The nose was tracking slightly to the right at 5 feet above the runway and airspeed was about 85 knots. I then asked the PI to start retarding the power levers. As she did, the nose came around to the left and lined up with the

runway and the aircraft touched down normally.

In my mind, this should've been the end of the emergency procedure. In reality, this is where it got exciting. The aircraft touchdown couldn't have been nicer—straight on the center line and controlled. What

# EAT

CPT WENDY REED  
Arizona Army National Guard

would give us the right airspeed, rate of descent and, most importantly, keep us properly aligned in our lane. While we were looking pretty good on lane alignment, we were going to land long if we committed to the approach on our first attempt. Since you only get one chance, it's best to set yourself up for success. We were still flying, so we didn't need to rush the landing. We made the decision to do a go-around.

The go-around was the worst part of the flight. Up to that point, the flight had been basically straight and level. We now had added two right turns to the day's excitement, maintaining our airspeed and rehearsing the landing on the downwind leg. The aircraft rolled left as we made wide right-hand turns and we were once again on an extended final for Runway 90. As we began our approach, things were lined up nicely for a landing well within the first third of the runway. We were coming in fast, maintaining the EP's minimum of 90 KTAS until 10 to 20 feet above touchdown. As we neared the ground, the aircraft lost lane alignment and began turning right. We pulled the power levers back and heard a "Rotor RPM low" warning.

We landed hot—somewhere between 80 and 90 KTAS—perfectly aligned in our lane. Once on the ground, we applied full aft cyclic in an attempt to slow the aircraft. We veered off to the right again, so we pulled the power levers back to the idle stop and then completely off. The aircraft then veered left about 30 degrees, heading toward a ditch on the runway edge. The only way we could control the aircraft heading was to apply counter pressure on the brakes—which seemed to have little effect as we barreled toward the ditch. The thought ran through my head, "We have just landed this thing and now we're going to roll it over in a ditch!" We hit the ditch and rolled left, but then corrected back upright and to the right. The aircraft then leaned right, but corrected back to a nice upright position. The rocket pods we'd decided not to jettison had kept us from rolling over—potentially saving our lives. The ride of a lifetime ended just short of a fixed-wing aircraft parked off the runway's edge. <<

“The **THOUGHT** **RAN** through my head, 'We have just **LANDED** this thing and now we're going to **ROLL IT** over in a **DITCH!**'”

I hadn't worked into the directional control equation was the gravel on the runway. After touchdown, the aircraft started veering to the right side of the runway. I applied aft and left cyclic and pressed on the left brake. When I did, the left tire slid in the gravel while the torque in the rotor system seemed to aggravate the situation. We were getting ready to run off the edge of the runway when I asked the PI to pull the power levers off. My thought was to eliminate the remaining torque and reduce the risks of a post-crash fire. The aircraft came back to the center of the runway and then headed for a deep ditch off the runway's left side. I applied full aft and right cyclic and stood on the right brake. I remember

looking up through the canopy and counting the blades as they slowly came around. The rotor had already bled to nothing. The right main tire slid in the gravel and caught just enough traction to minimize our angle as we entered the 2-foot-deep drainage ditch bordering the runway. As the aircraft veered into the ditch, the left main gear struck the ditch's left bank. This impact, combined with about a 35-knot forward speed, caused the aircraft to rock to the left. Here is where the decision to keep the rocket pods paid dividends. The left-side pod contacted the ground and kept the aircraft upright. The aircraft then slid to the right through the muddy ditch and hit the ditch's right bank. The aircraft

rocked to the right and, this time, the right rocket pod kept us upright. We then settled back onto the main gear as the aircraft rolled through the ditch and onto the parking apron near the end of the runway. When the aircraft stopped we were upright, the rotor blades had stopped and the helicopter and aircrew were both still in one piece. We were happily greeted by the fire department and the personnel who came out to watch the show.

## Lessons learned

- **Always fly the aircraft.** It seems like a simple statement, but in more than one instance, I've seen crewmembers stop flying and become passengers. We milked every bit of power, airspeed,

altitude and rotor out of this aircraft before coming to a safe stop.

- **Know the aircraft's capabilities.** Also know what to expect if the worst happens. I was thankful this wasn't the first time I had executed a go-around with an aircraft in an unusual attitude. My training gave me the confidence to fly the aircraft and make a safe landing.

- **Remain calm and professional.** Our aircrew didn't panic and worked very well together throughout the incident. If you have an emergency and are still able to fly, take advantage of the time to formulate a course of action and then brief it to your crew. With most catastrophic failures, you only get one chance to safely land the aircraft. Knowing that, why





rush and accept a landing plan that is less than ideal based on the situation?

I hope sharing our experience will help someone in the future. I'm also grateful the U.S. Army Combat Readiness Center is using this experience to promote necessary changes in the way we train our new aviators. The aircraft we fly are the safest in the world. Our training is outstanding; however, there is always room for improvement. I don't view our job as unnecessarily dangerous because we receive excellent training on our equipment. However, our job can be unforgiving. Take the time now to prepare for whatever Army Aviation throws at you. Tomorrow, you may be the guy who thinks he's got the environment and the enemy beat ... only to hear a loud "bang." Be ready! «



# AND THE AWARD GOES TO ...

**CW4 ROBERT ROEBUCK**  
U.S. Army Combat Readiness/Safety Center  
Fort Rucker, Ala.

**T**he Broken Wing Award recognizes aircrew members who demonstrate a high degree of professional skill while recovering from an in-flight failure or malfunction requiring an emergency landing. The U.S. Army Combat Readiness/Safety Center commanding general recently approved the following award:

CW3 JESSIE P. SCRUGGS and CPT WENDY REED  
FOB Salerno, Afghanistan  
Arizona Army National Guard  
AH-64D

On May 31, 2007, at approximately 0825, CW3 Jessie P. Scruggs, the pilot in command, and CPT Wendy Reed, co-pilot gunner, were conducting a MEDEVAC escort mission in support of Operation Enduring Freedom. The flight of two aircraft was returning to Forward Operating Base Salerno, Afghanistan, after picking up two patients. Without any prior indication or warning, the crew felt and heard a loud bang from the rear of the aircraft. The aircraft immediately yawed 15 to 20 degrees to the right with a 5-degree tuck of the nose. The CPG was on the controls and applied full left pedal, but without results. The CPG leveled the aircraft at 300 feet above ground level while the PC assessed the situation.

The PC called the MEDEVAC aircraft and asked them to check for any visible damage to the aircraft. When the MEDEVAC aircraft maneuvered to the rear of the AH-64D, they confirmed the entire tail rotor had separated from the aircraft and severed the stabilator in half.

The PC took the flight controls and initiated a roll-on landing attempt at approximately 100 knots. While on short final, the PC determined the lane alignment and approach attitude were inadequate, forcing the pilots to execute a go around. On the second attempt, the CPG manipulated the power levers while the PC flew the

aircraft. Neither crewmember lost their focus and touched down at approximately 95 knots. The power levers were retarded to the off position and lateral control of the aircraft was lost due to rotor decay. Control and stopping was accomplished by the use of differential toe braking. The aircraft drifted to the left into a ditch and rolled left until the left rocket pod contacted the ground. The aircraft then rolled to the right until the right rocket pod contacted the ground, keeping the Apache upright. During the entire landing sequence, the PC controlled the aircraft using only the brakes. Braking efficiency was further complicated because the runway surface was composed of small gravel and dirt. The aircraft came to rest with less than 200 feet of useable runway remaining.

A successful outcome was achieved only through the use of exemplary crew coordination techniques and emergency procedures. The PC and CPG maintained a perfect crew coordination relationship throughout this incident. Both crewmembers showed mature, level-headed airmanship. Faced with an emergency requiring immediate action, the pilots safely landed the aircraft, preventing serious injury to themselves and a Class A aircraft loss. For this, both crewmembers are awarded the Army Broken Wing Award. Congratulations!

For more information on the requirements for safety awards, check out the Army Accident Prevention Award Supplemental Guidelines dated June 5, 2007, on the USACRC Web site. «

**A**cross the fleet, we're seeing advances in aircraft technology. These advances are designed to give the aircrew pertinent and timely information about the operation of their aircraft. The downside is our aircrews are spending more time "inside" the aircraft. The ACT-E program will assist our commanders, their standardization instructor pilots and safety officers to ensure the commander's intent is communicated efficiently to every rated and non-rated unit crewmember.

# ACT-E UPDATE

## AIRCREW COORDINATION TRAINING - ENHANCED

**CWS DOUGLAS B. BROWN**  
Directorate of Training and Doctrine  
U.S. Army Aviation Werflighting Center  
Fort Rucker, Ala.

### What is ACT-E?

Aircrew Coordination Training - Enhanced is a modernized version of the Aircrew Coordination Training course that uses multimedia vignettes in conjunction with an instructor to promote free and open discussion. The vignettes are taken from actual accidents, incidents and trends. ACT-E is designed as a set of principles, attitudes, procedures and techniques that enable our aviators and crews to operate more effectively and safely. It's a vital element of composite risk management within our combat formations.

The intent of ACT-E is to build an effective team, not create robots. Unfortunately, the accident data trends from the U.S. Army Combat Readiness Center are startling:

- 239 Class A and B accidents from fiscal 2002 to 2007
- 54 percent of these accidents were attributed to crew communication errors
- 11 percent were attributed to task saturation or failure to prioritize actions, sequencing and timing
- Failure to plan and mentally rehearse mission events and responsibilities
- Since 1993, 79 percent of the Army's Class A and B accidents have resulted from human error; 71 percent have been attributed to the failure of a single individual

### The top six failures are:

- Failure of the pilot on the controls to properly direct assistance from other crewmembers

- Failure of a crewmember to announce a decision or action that affected the ability of other crewmembers to properly perform their duties
- Failure of a crewmember to communicate positively (verbally and nonverbally)
- Failure of the pilot in command to assign crew responsibilities properly before and during the mission
- Failure of the pilot not on the controls or other crewmembers to provide information that was needed or had been requested previously by the pilot on the controls
- Failure of the pilot on the controls to execute flight actions in the proper sequence with actions of other crewmembers.

### Who does ACT-E apply to?

ACT-E training applies to ALL active duty, Reserve Component, Department of Army Civilian and contractor rated and non-rated crewmembers operating as part of an Army aircrew, regardless of FAC level. ACT-E also applies to all operators, supervisors and instructors/trainers of unmanned aircraft systems.

### What are the requirements of ACT-E?

Crewmembers qualified under previous ACT policies and directives are not required to complete the new ACT-E Qualification Core Course. As new aviators progress through flight school, they are taught the core course. All others are required to complete the qualification course. Crewmembers

who transfer from other services or enter the Army under the Civilian Acquired Skills Program must complete the ACT-E Qualification Core Course.

All aircrew members must complete the Aircraft Sustainment lesson for the airframe they operate before progressing to Readiness Level-1. Presently, there is not a stand-alone module for non-rated crewmembers. Non-rated crewmembers will complete the same modules as the rated crewmembers, and it's recommended they accomplish this training together.

Crewmembers will complete the applicable ACT-E sustainment lesson every 12 months. Initial completion of the ACT-E course counts toward the annual requirement. Upon transition to ACT-E, units will only use new ACT-E courseware.

### Who can conduct ACT-E training?

Anyone who has completed the ACT train-the-trainer course can conduct the ACT-E training. The ACT-E course has been designed to use an instructor or facilitator to promote discussion and open dialogue. The Directorate of Evaluation and Standardization has provided this training through numerous mobile training teams. The ACT-E train-the-trainer course is now available online.

### How do I access the sustainment lessons?

Due to the sensitivity of the material presented, these lessons are only available through Army Knowledge Online. You must have an AKO login and



password to access the ACT-E lessons. Instructions for accessing the lessons can be found at <https://rucker-dtac.army.mil>. Access to the ACT-E lessons is restricted to personnel approved by the brigade commander and verified by the ACT-E course manager.

#### **What if my unit is forward deployed without NIPR net?**

Currently, the DES team is the only unit that has a hard copy on CD-ROM. They have been conducting ACT-E training in conjunction with their unit assistance visits. We are currently

working on a nonrestrictive means of distributing the lessons to the field while still protecting the information.

#### **What aircraft sustainment modules are available on ALMS?**

The AH-64D, OH-58D, UH-60, CH-47, C-12 and UAS sustainment lessons and the core qualification courses are available on the ALMS. Since it is impracticable to develop a lesson for each airframe in the Army's inventory, units should use the module most closely related to their aircraft. (For

example: for units equipped with AH-64A, use the AH-64D; for UC-35 units, use the C-12 lesson.) A new series of sustainment lessons will be published periodically so updated trends can be provided for your use.

#### **What is the future of ACT-E?**

The Directorate of Training and Doctrine team is actively soliciting input from the field, accident/incident data from the USACRC and observations from the DES team. A review of Training Circular 1-210, *Aircrew Training Program Commander's Guide to Individual, Crew, and Collective Training*, is currently underway and will reflect clarifications from the Aviation Branch Chief with respect to aircrew coordination training. If you know of a trend that needs to be discussed or you would like to see in a future sustainment lesson, contact DOTD at DSN 558-9680 or 334-255-9680. Your input is needed to improve this training program and ensure it meets the needs of our field commanders and their formations. ◀

**ACT-E TRAINING APPLIES to ALL** active component, Reserve Component, Department of Army Civilian and contractor rated and non-rated crewmembers **OPERATING** as part of an **ARMY AIRCREW, REGARDLESS** of FAC level.”

# VEHICLE CREW

SEAN MORRILL  
4th Brigade Combat Team, 4th Infantry Division  
Fort Hood, Texas

**T**echnological advancements continue to provide today's Soldiers with greater capabilities than ever before. Armor enhancements, ballistic glass and additional mission equipment in Army vehicles all offer extra protection on the battlefield. However, these advancements have come at a price for vehicle crews who've had to cope with restricted outside visibility and altered vehicle handling. As the Army continues to improve and upgrade its combat vehicles, the need for effective crew coordination and communication has become essential for crews to safely complete their missions.

## SAY WHAT?

Standardized words and phrases, such as those used in radio transmissions, help crews avoid confusion and allow them to react more quickly and efficiently. Below are examples of some common words or phrases crews might use and their meanings.

Cease fire  
Clear  
Execute  
Firing  
Get out!  
Hold  
Maintain  
Monitor  
Move  
Negative  
Now

Command to stop firing but continue to track  
Clear of obstacle or traffic (e.g. clear right)/weapon is clear  
Command to initiate an action  
Announcement that a weapon is to be fired  
Command to make an emergency exit from vehicle (say 3X)  
Command to hold present position  
Command to continue or keep the same  
Command to maintain constant watch or observation  
Command followed by direction (forward, back)  
No, incorrect or permission not granted  
Indicates that an immediate action is required



# COMMO



## Effective crews communicate

Effective vehicle crews are made up of assertive crewmembers who provide input to the vehicle commander. Every crewmember knows they're a part of the team and are willing to help without being asked. The entire crew acts as a team in mission planning, execution and after-action reviews and, with the exception of short-notice missions or high-workload conditions, analyzes information and contributes to decisions.

Vehicle commanders establish an open, professional climate at the beginning of every mission. Effective crews maintain this atmosphere

by communicating vital information in a clear, timely manner so conditions, actions and decisions are clearly understood. Finally, effective crews view AARs as learning experiences that can enhance future crew performance.

Some good crews do these things without having a background in crew coordination training. They intuitively know they need to have open communications, provide professional input and work as a team in support of the vehicle commander.

## Standardized terminology

Standardized words and phrases, such as those used in radio transmissions, help crews avoid confusion and allow them to react more quickly and efficiently. Using words known by everyone in the crew also prevents them from having to be repeated. If the operator's manuals have a standard callout or term for

a piece of equipment, get in the habit of using it, especially if a new crewmember joins the team. If someone doesn't understand what you said, try saying it another way or in clearer terms instead of repeating it multiple times or raising your voice.

Crew coordination is more of an art than science and requires continuous practice. Good crews constantly work on improving their coordination and use AARs as a forum to improve their performance in the future. These combat-proven techniques can help you better accomplish your missions and prevent accidents. Discuss these methods with your crew and practice them on every mission. For more information, see aircrew Training Circulars 1-248 or 1-219. Both can be downloaded from the Army's Publishing Directorate Web site at <http://www.army.mil/usapa>. ◀

Report

Roger

Rollover!

Say again

Slow down

Speed up

Stop

Target

Traffic

Turn

Unable

Up on

Weapons red/amber/green

Weapon on fire/safe

Command to notify

Message received and understood

Command to brace/take immediate rollover actions (say 3X)

Repeat your transmission

Command to reduce speed

Command to increase speed

Command to go no farther, halt at present position

An alert that a threat has been spotted

Refers to another vehicle, followed by a clock position

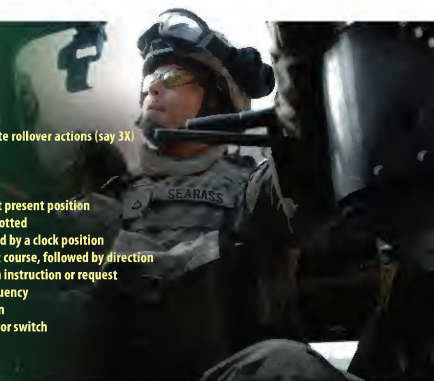
Command to deviate from current course, followed by direction

Indicates inability to comply with instruction or request

Indicates radio selected and frequency

Indicates loaded status of weapon

Indicates status of weapon selector switch



*Editor's Note: This article is based upon an installation accident investigation. The goal of this article is to provide lessons learned to help prevent future accidents. The names of the Soldiers in this story have been changed, but the facts are accurate.*

**G**EN George S. Patton once said, "A poor plan executed well is far better than a good plan executed poorly." So what happens when a designated driver plan goes bad?

SPC Jim Woodson had been something of a model Soldier in his unit. A two-tour combat veteran with a reputation of leading by

Evan and Jim had been in the bar playing pool. At some point, Evan wandered off. Terry checked the area around the bar, its restrooms and the parking lot until he found him. Terry stuck with Evan for 20 minutes or so, periodically checking on Jim, who was talking to some girls. Sometime later, Terry lost track of Jim. After searching the bar and

### Why did this happen?

Accidents don't happen in a vacuum—the key element is always people. Like many young Soldiers, Jim felt he was indestructible. Having survived combat, he felt he could survive anything. That night probably wasn't the first time he'd tried to drink and drive—but it was the last time.

# WHEN A DESIGNATED DRIVER PLAN FAILS

**JIM WISHE**  
Fort Benning, Ga.

example, he'd won the respect of fellow Soldiers and earned his leaders' recommendation for promotion. It had been an interesting Friday for Jim. He'd gone on a foot march that morning and then later went before a promotion board. He'd done well on his promotion board and was looking forward to pinning on his sergeant's stripes. That afternoon, his unit sponsored a recreation event at a local lake. With the world going his way, he headed that night out in his pickup truck to celebrate at a sports bar.

Jim met fellow platoon members SPCs Evan Marshall and Terry Large at the sports bar. Terry didn't drink and was the obvious choice for designated driver should Jim or Evan need a ride home. When they met that night, Terry didn't ask his friends for their keys. He decided, instead, just to keep a careful eye on his buddies.

parking lot, Terry saw that both Jim and his pickup truck were gone.

As it turned out, Jim had left the bar by himself and was driving back to his barracks on a rural road that wound through the mountains. At 1:43 a.m., Jim's truck ran off the road and rolled over. The rollover forces catapulted Jim—who was unbelted—out of the truck and caused severe head injuries. Although he was still alive when medical personnel arrived and transported him to a medical facility, his injuries proved fatal later that morning. Ironically, the Soldier who had a reputation for upholding standards on duty let them drop when he shed his uniform. With a blood alcohol content of 0.24—three times the state's limit—Jim was far too impaired to drive safely. Dead less than a day after his promotion board, he'd never see the sergeant stripes he'd earned.

Jim made at least four decisions that contributed to his death:

- He decided to consume alcoholic beverages.
  - He decided to drive after drinking.
  - He decided to circumvent the designated driver plan.
  - He decided to drive without wearing his seat belt.
- What about Terry's role? The most effective battle buddies for preventing these tragedies are designated drivers who fulfill their responsibilities—including taking away a buddy's keys before they get drunk. As Terry found out that night, you can't watch everyone all the time. The price of letting a buddy slip through the cracks can be an empty space at the next formation.

### What about leaders?

Regardless how well Soldiers perform on duty, do their leaders

“The most **EFFECTIVE BATTLE BUDDIES** for **PREVENTING** these tragedies are designated drivers who **FULLFILL** their responsibilities—including **TAKING AWAY** a buddy’s keys **BEFORE** they get **DRUNK.**”

know them well enough to recognize if they’re at heightened risk off duty? After all, when does a Soldier stop being a Soldier or a leader stop being a leader? When did the Army profession become merely an 8-to-5 job?

Training, without the discipline to follow it, won’t prevent accidents. Jim had completed unit-, installation- and Army-level training to make him a more skillful and defensive driver. He had nearly five years’ experience driving privately owned vehicles before this accident. Jim knew the right things to do—he just chose not to do them.

Bad consequences follow bad choices—and choices are a matter of the

will, not chance. Jim didn’t intend to die that night—but he couldn’t escape the consequences of his choices.

Consequences are typically predictable, which means most accidents are preventable. When you have to decide whether to ride with a designated driver or drink and drive, what will you choose? Will you be able to live with the consequences? «



# HUNTING FOR TROUBLE

GREGORY J. SANCHES  
1/25 Stryker Brigade Combat Team  
Fort Wainwright, Alaska

Two of my buddies and I had bounced over rocks and logs on our all-terrain vehicles for nine hours as we made our way down a riverbed. We'd camped out for 10 days, finished a successful moose hunting trip and loaded the meat onto an airplane to be flown to Fairbanks. We were trying to cover the 30 miles from our hunting camp high in the Alaskan backcountry back down to the plains. With the temperature headed for the basement, we needed to get out of the mountains before we got snowed in.

We'd traveled about 25 miles and were nearing the point where the trail went from the riverbed into the forest. I was leading the way and following some ATV tracks when the trail suddenly cut away from the riverbed and went up the bank. I gunned my ATV and started up the slope. For a fleeting moment, I thought it might be too steep, but I quickly tossed that idea aside. Moments later, I realized I should've listened to that voice. As my front wheels crested the bank, I felt the front of the ATV rising up and coming over on me. As it did, I was thrown off and landed in the riverbed, bouncing my head off several rocks. My ATV continued rolling over and landed upside down not far from me. As I lay there gathering my thoughts, I was glad I'd worn my helmet. Without it, I'd have been seriously injured.

One of my hunting buddies came running over to see if I was OK. He got me to my feet and checked me out. Fortunately, the only thing I hurt was my pride. We rolled my ATV back onto its wheels while I prayed that everything was fine. I was grateful when my ATV started right up and did a thorough system check to ensure everything was working. The only damage was a bent gear rack.

How did I get into trouble that day? There were several hazards I didn't consider. I didn't think about the extra weight on the back of my ATV or how that affected its handling. I now realize that extra weight is what pulled my ATV over backward as I tried to go up the steep bank. I was also tired and my thoughts had turned toward getting home, enjoying a good meal and sleeping in a warm, comfortable bed. I was so eager to get home I stopped thinking about the dangers around me. I'd skipped the first two steps of composite risk management—identifying and assessing the hazards.

Looking back, I knew I shouldn't have tried to go up the riverbank where I did. After my accident, we checked farther down the river and found a better place to exit. We should have also stopped and camped for the night instead of pushing it like we did. We could've waited until the next day to take the boat trip across the Tanana River for home. That had been our fallback plan and we should've stuck to it.

Yes, it was an enjoyable hunt, and I love my time in the backwoods, but I have learned you have to know when to stop and take a break. The Alaskan backwoods can be an unforgiving place. It's a land where you must rely on yourself and your skills. Pushing it—letting "get-home-itis" blind you to the risks in your environment—is not smart when you're roughing it in the Last Frontier. <<

## » DID YOU KNOW?

The ATV Safety Institute has informative videos and classes available to help hone your riding skills? Check them out online at <http://www.atvsafety.org/>.





# UPHILL BATTLES

The following tips from the ATV Safety Institute can help you avoid having an accident like the one described in this story:

- Some hills are too steep for your abilities. Use common sense. If the hill you're approaching looks too steep, it probably is. Also, some hills are just too steep for your ATV, regardless of your abilities.
- Never ride past the limit of your visibility. If you cannot see what is on or over the crest of a hill, slow down until you have a clear view.
- The key to being a good hill rider is to keep your weight uphill at all times.

**When approaching an uphill climb, you should:**

- Keep your feet firmly on the footrests.
- Shift the ATV into a lower gear and speed up BEFORE climbing the hill so you can maintain momentum.
- When approaching an uphill climb, either move up on the seat and lean forward, or stand and position your torso over the front wheels.

**As you're climbing, you may need to shift to a lower gear to prevent lugging the engine or stalling. To shift into a lower gear on a hill, remember:**

- Keep your bodyweight forward as you prepare to shift gears. For steeper hills, lean forward as much as possible.
- Shift quickly while momentarily releasing the throttle; this will help keep the front wheels from lifting.

If you don't have enough power to reach the top of the hill but still have forward momentum and enough room to turn around safely:

- Keep your weight uphill.
- Make a U-turn before you lose speed.
- Proceed downhill in a lower gear, keeping your weight to the uphill side.

**If you're riding uphill and lose all momentum:**

- Keep your weight uphill and apply the brakes to come to a stop.
- Never allow the ATV to roll backward.
- Apply the parking brake while keeping your weight uphill.
- Dismount on the uphill side or to a side if pointed straight uphill, and follow the procedures described in your owner's manual.

# HONEY, CAN I DO IT ONE MORE TIME?

HARVEY V. JONES III  
1st Brigade Combat Team  
101st Airborne Division  
Fort Campbell, Ky.

**A**s a guy, I'm easy to please. Put me in front of a barbecue grill, give me a beer and let me watch football on TV. However, with fall beginning and winter just around the corner, it's just a matter of time before I have to put away my grill. My wife knows I dread the end of the grilling season, so she's not surprised when I ask her, "Honey—can I do it one more time?"

Still, earning the final "kitchen pass" of the grilling season isn't my only concern. Barbecue grills can be dangerous—especially if they've seen heavy use and little maintenance. You're in the Army, so you're familiar with Preventive Maintenance Checks and Services. They're those "before," "during" and "after" checks you do on your military equipment so it doesn't blow up, quit running or fall out of

the sky. Have you ever thought about doing PMCS on your barbecue grill? Might not be a bad idea, especially since you have a highly flammable gas—propane—very close to your burners.

## Let's start with the "before" operation checks:

1. Uncover your grill and look for any obvious damage which might hinder proper operation. Check for items such as broken knobs, exposed



# TOASTY LESSONS LEARNED

DEBBIE JOYCE  
U.S. Army Forces Command  
Fort McPherson, Ga.

**H**ave you ever had your barbecue grill's igniter fail and you had to find a different way to light the burners? Be careful what you do!

We were barbecuing on the back porch while watching a game on TV. The igniter on our grill wasn't working, so my husband used one of those handy little utility lighters to ignite the burners. That did the trick, and he put the lighter on one of the grill's side tables while the

burgers and dogs cooked. After a few minutes, he went back to the grill to turn the meat. Suddenly, there was a BOOM! In my side vision, I saw a flash of fire and thought the propane tank had exploded. I was terrified that my husband had been injured, but was grateful when I saw him standing in the yard unharmed.

The culprit in the explosion wasn't the grill or propane bottle—it was the utility lighter. I can't tell you how far away the lighter was from the burners, but I can tell you

it became overheated and exploded. Fortunately, the only casualty was the singed hair on my husband's right arm. We gained a couple of useful lessons learned from this experience.

First, we ordered a new igniter for our grill. It's not that expensive and beats using alternative means to light the burners. Second, if we ever use a utility lighter again, I can guarantee it won't just be laid down—especially near any source of flame. We don't need any more toasty lessons learned! <<



# TOTAL RECALL

The Consumer Product Safety Commission has recalled the following gas grills:

- Perfect Flame™ four-burner gas grill (25 inch by 18 inch) sold by Lowe's retail outlets. The model may be missing the hose connecting the manifold to the side burner.

- Char-Broil® two-burner gas grill, model number 463720407, sold by Big Lots stores. These grills may contain an incorrect heat shield that could expose the propane tank, hose and regulator to excessive heat and cause a fire.

- Weber Genesis® 320-series gas grills sold by several different retail stores. The stainless steel gas tube to the side burner may have been cracked or broken off during shipping.

For more information or to sign up to receive free Neighborhood Safety Network alerts and posters, go to [www.cpsc.gov](http://www.cpsc.gov).

gas as a propellant. Never use one of these while the burners are ignited.

The most important "during" operation check is to never leave your grill unattended. Fat dripping onto your burners can catch fire and end up burning more than your dinner.

## Finally, we have the "after" operation checks:

1. Turn off the propane tank.
  2. Allow the flame to go out and then turn off the knobs on the main unit.
  3. Allow the grill to cool for at least 10 minutes.
  4. Use a cleaning brush to scrape any burned food off the grill grate.
  5. Once the grill has fully cooled, wash it with warm, soapy water and then rinse it off to remove any remaining food.
  6. Close the lid and cover for later use.
  7. Keep propane bottles in a shady or cool location outdoors—not inside any structure, including porches or balconies.
- When it's time to put away the grill for the season, remember to disconnect the hose from the propane bottle. Ensure you cover the grill's connections to keep critters or debris from getting inside.
- Until the chill ends your fun with the grill, be careful and enjoy! ◀

igniter wires or frayed hoses leading from the propane tank to the valves.

2. Check for leaks where the regulator screws onto the top of the propane tank. The best method is to apply soapy water to the area and look for bubbles. If air bubbles appear, you have a leak and need to tighten the regulator BEFORE using. Failing to do so could cause an explosion, resulting in injury or death.

3. Don't store extra propane bottles beneath your grill. If these bottles get hot, they can vent propane right into your burners, which is not a good thing.

4. Make sure your grill is clean and free of burnt, old food. You also might want to spray your grilling surface with some type of nonstick spray. However, be advised some cooking sprays use a compressed, flammable

# Where's the Fire?

**FRANK MCCLANAHAN**  
U.S. Army Combat Readiness/Safety Center  
Fort Rucker, Ala.





**A**ccording to the Occupational Safety and Health Administration, workplace fires kill about 200 workers each year and injure nearly 5,000. In many of these workplace fires, inadequate fire extinguishing systems and locked fire exits contributed to the losses. To prevent those losses, it's important to take a closer look at inspections, exits, fire extinguishers and training.

### Inspections

When inspecting workplaces, as a minimum, be sure to check for the following:

- Ensure extension cords are not being used in place of permanent wiring. If additional receptacles are needed to power appliances and equipment, have a certified electrician install them.
- Do not run power cords for appliances and equipment under carpeting. Over time, the protective insulation can be worn or frayed, resulting in bare electrical conductors arcing and starting a fire.
- Ensure flammable materials are properly stored either outside the workplace or in an approved fireproof storage cabinet.
- Permit smoking only in designated smoking areas and ensure noncombustible receptacles are available.
- Do not store combustible items near

electrical appliances or equipment. Also, keep the area around this equipment clear to ensure proper ventilation and cooling.

- Check electrical appliances and equipment for the Underwriter's Laboratory (UL) label before purchasing them.

### Exits

Ensure you check fire exits when doing workplace inspections. Consider the following as you develop your checklist:

- Ensure your facility has a sufficient number of exits. Each workplace should have at least two separate means of escape.
- Inspect emergency lighting to ensure it properly illuminates the paths to exits.
- Check the exit routes from your building to be sure they are properly marked as exits and are free and clear of obstructions.
- Be sure to keep doors marked as fire exits unlocked at all times while employees are in the building.

### Firefighting equipment

Fire extinguishers are an important part of a fire prevention program. When used properly, they can save lives and property by putting out small fires or controlling them until the professionals arrive. In addition, fixed systems can enhance fire safety within a facility by detecting fires,

**“ACCORDING to the Occupational Safety and Health Administration, **WORKPLACE FIRES KILL** about **200 WORKERS** each **YEAR** and injure nearly **5,000.**”**

sounding an alarm and releasing a fire suppressant.

Ensure your workplace has enough fire extinguishers and they are the proper type for the fire hazards present. The types and uses of fire extinguishers are listed below—

- Type A: Use for ordinary combustibles such as paper and wood.
  - Type B: Use for flammable liquids such as grease, solvents and gasoline.
  - Type C: Use for electrical fires involving equipment such as fuse panels, computers and other energized equipment.
  - Type D: Use for combustible metals such as magnesium, titanium and potassium.
  - Type K: Use for kitchen fires involving combustible cooking liquids and fats.
- Conduct monthly visual inspections of fire extinguishers for proper marking, maintenance and serviceability. During your inspection, be sure there are no obstructions blocking access to the extinguishers.

If your workplace is equipped with a fire suppression system, be sure it is inspected and properly maintained.

### Employee training

Workers need to know how to properly use fire extinguishers and should be taught, as a minimum, the following:

- Sound the fire alarm and notify the fire department.
  - Before approaching a fire, identify a safe evacuation path and ensure nothing obstructs it.
  - Use the appropriate extinguisher for the type of fire encountered.
  - Discharge the extinguisher within its effective range using the P.A.S.S. (Pull, Aim, Squeeze, Sweep) technique (see graphic below).
  - Move away from an extinguished fire just in case it flares up again.
  - If the fire extinguisher has been fully discharged and the fire is not out, evacuate the workplace immediately. Be sure workers also understand they are to evacuate immediately if the fire progresses beyond their ability to control it.
- For more information on preventing workplace fires, visit the Occupational Safety and Health Administration Web site at <http://www.OSHA.gov>. ◀

## CAN YOU P.A.S.S. THIS TEST?

Do you know what to do if you have to fight a fire with an extinguisher? If not, familiarize yourself with the simple P.A.S.S. technique described below:

- Pull the pin—this will also break the tamper seal.
- Aim low, pointing the extinguisher's nozzle, horn or hose at the base of the fire.
- Squeeze the handle so it will release the extinguishing agent.
- Sweep from side to side at the base of the fire until the extinguisher is empty and the fire is out.

**"D**ismount right!" It sounds simple enough, correct? Well, that would depend on the level of detail and frequency of your battle drill rehearsals. In the following case, it wasn't that simple, and the resulting accident cost one noncommissioned officer his life.

# BATTLE DRILL

**1SG (RET) MIKE BARKSDALE**  
U.S. Army Combat Readiness/Safety Center  
Fort Rucker, Ala.

**ANOTHER SIDE OF CO**

In preparation for deployment in support of Operation Iraqi Freedom, an infantry rifle company planned two weeks of live-fire training, progressing from team-level training through platoon-level training. It was during the platoon-level training that the accident occurred. After securing their first objective, the platoon received an order to continue their mission and assault a second objective, a change to their original plan. Upon arrival at the support-by-fire position for the second objective, the squad leader for the second stryker vehicle in the platoon gave his squad the command to "dismount right." His squad did just that, dismounting to their right (driver's side) as they exited the rear of the vehicle.

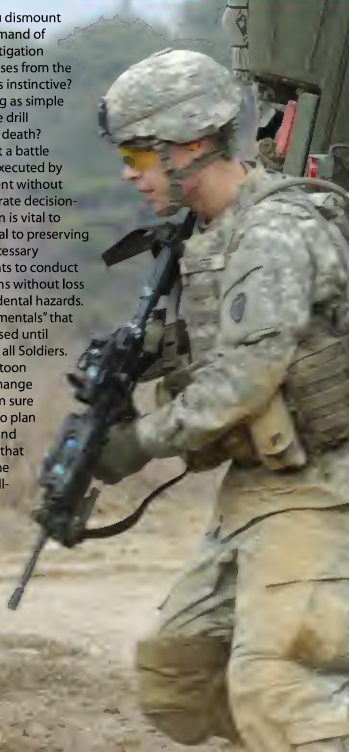
This squad immediately suppressed the objective while the rest of the platoon maneuvered to the left of the objective. As the squad leader attempted to dismount with the squad, his gear tangled in the vehicle, and it took him a few minutes to get loose and off the vehicle. When he did dismount, he dismounted right, or out of the left rear (the passenger's side) of the vehicle. Once he cleared the right side of the vehicle (remember, his squad is on the left side of the vehicle, suppressing the objective), he saw the platoon assaulting the left flank of the objective. As he ran across to join the platoon, the squad leader ran in front of his squad's support-by-fire position and suffered a fatal gunshot wound to the head. One of his team leaders fired the round that killed him.

When asked the question of

which direction would you dismount the vehicle given the command of "dismount right," the investigation board got differing responses from the unit. Were their battle drills instinctive? Ask yourself, did something as simple as a poorly executed battle drill contribute to this Soldier's death?

Our doctrine states that a battle drill is a collective action executed by a platoon or smaller element without the application of a deliberate decision-making process. This action is vital to success in combat or critical to preserving life. Battle drills are the necessary building blocks for elements to conduct complex combat operations without loss of life from tactical or accidental hazards. These drills are the "fundamentals" that must be constantly rehearsed until they are second nature for all Soldiers.

In this accident, the platoon received an unexpected change in their original mission. I'm sure you've heard before that no plan survives the first contact, and this is the kind of scenario that the commander wanted the platoon to experience. Well-rehearsed and executed battle drills give a platoon flexibility to react to changing scenarios and help to ensure everyone understands what "dismount right" means! Well-executed battle drills will help to keep your Soldiers safe and in the fight. <<



# ILLS

NEW COORDINATION



**T**he “travel light, freeze at night” theory for operations in cold weather still is seen in some units. Ensuring your Soldiers arrive fit to fight calls for specific training. One of the most basic combat multipliers is how your Soldiers dress for the cold. Make the weather a force multiplier rather than a detractor that leads to cold weather injuries.

Our bodies produce heat, which keeps us warm and alive. Being cold and wet forces our bodies to work overtime to compensate for heat loss. If you can't generate more heat than you lose, eventually you will become hypothermic and possibly die if you're not treated.

To keep your head warm, use a wool or Lycra watch cap and the multifunction neck gaiter for field operations. During periods of extended exertion, a watch cap can be easily removed for quick ventilation.

The first layer of clothing must wick moisture away from your body. Sweat will chill Soldiers quickly if it remains trapped against their skin. Medium or lightweight polypropylene or a similar synthetic fiber pulls moisture away from the skin. The brown cotton T-shirt has no wicking ability and traps moisture against your body.

The next insulating layer can be the field jacket liner, Polartec® Spear suit top or a similar fleece jacket. These items will hold warmth next to your body's core, which needs more insulation than your arms and legs. If you're moving regularly, a pair of mid- to lightweight polypropylene underwear often will be all you need to protect your extremities.

Finally, a breathable waterproof or windproof outer shell over the insulating layers allows your body's moisture to escape while preventing rain and snow from soaking through to your skin. The issued Gore-Tex® pants and parka work well as the final layer. Breathability is the key to keeping dry. Don't confuse the Gore-Tex® jacket with a rain suit. A rain suit may take up less space in your rucksack, but the ability to wick moisture away from your body in cold weather is critical.

Size your winter boots correctly by wearing the same socks you'll wear in the field. Your first sock will be a lightweight polypropylene or dress sock. (Never wear cotton socks in the winter.) The first sock layer helps reduce friction, which causes blisters.



**SSG STEPHEN JENNINGS**  
U.S. Army Mountain Warfare School  
Jericho, VT.

**“RESIST the ‘STANDARD’ clothing. Soldiers VARY, and what works to some will WARM or COOL others.”**

# OVERDRESS

Next, add a mid- to heavyweight insulating sock. In extreme cold, add a final Gore-Tex® bootie to wick moisture away from your foot.

Boots should fit snugly, not tight. Little or no heel lift is an indicator you're on the right track. Walk up and down an incline or several flights of stairs to check for heel lift. Leave about a half-inch between your toe and the end of the boot. You should have enough space if you can lift your toes easily. Wear the boots for several hours before committing them to any extended operations. Change your socks as often as needed or as the tactical situation allows.

Your hands—like your feet—get cold quickly if they're not covered. Generally, mitten-style hand gear is

warmer than gloves. Gloves should not restrict blood flow to the fingers. Wear wool or polypropylene glove liners for fine hand work, but be sure to place them back in an over glove immediately. Minimize the time you have to remove your outer layers, and also practice basic Soldier skills with your over mitts. It takes some time, but all Soldiers can perform the vast majority of their missions without exposing their hands to the cold if they're properly trained.

Handling fuel in the cold requires extra caution because skin can flash-freeze if it comes in contact with fuel. Fuel, unlike water, does not freeze at 32 F. When handling fuel, use thick rubber gloves over your cold weather mittens. Keep in mind that once most cold weather gear is soaked with petroleum products, their insulating properties decrease dramatically. Immediately replace gas-soaked cold weather gear with a clean set.

Carry an extra set of outer gloves or mittens and several sets of liners. On extended operations, this allows Soldiers to dry one set while wearing the other. For shorter missions, the ability to throw on a dry pair as necessary can give you the edge to succeed. If your hands become very cold, place them in your armpits or crotch to rewarm them before putting on dry hand gear.

Start any movement "comfortably cool." Don't overdress; you'll generate plenty of heat when you step out. Ventilate along the way to keep from overheating, but avoid moving with your insulating layer of polypropylene or fleece as your outer layer. It's better to shed that layer and keep your Gore-Tex® shell as your outer layer. Your sweat will soak your insulating layer on an extended movement, and there is always

the chance that wet snow will add to your misery. Wear the Gore-Tex® with your lightweight polypropylene T-shirt—you'll be able to move comfortably for extended periods in all but the coldest climates. As soon as you stop, wipe the sweat off and put on your insulating layer. Don't waste all the heat you've generated by overcooling.

Resist the "uniformity is our standard" trap in cold weather clothing. Soldiers' metabolisms vary, and what may be comfortable to some will be unbearably warm or cold to others. Use common sense, stay as dry as possible and carry at least one more dry set of insulating clothing than you think you'll need. Then you will truly be dressed for success. ◀



## » FYI

A good way to remember some basic winter clothing rules is to think "C-O-L-D."

**C**—keep clothing **CLEAN**  
**O**—avoid **OVERHEATING**  
**L**—dress in loose **LAYERS**  
**D**—keep clothing **DRY**

**UNIFORMITY IS OUR  
'TRAP' in cold weather  
Soldiers' METABOLISMS  
what may be comfortable  
be UNBEARABLY  
COLD to OTHERS. ”**



# Safety in Numbers



**CWS ROBERT REYNOLDS**  
Headquarters, Headquarters Company  
Third Army  
Fort McPherson, Ga.

**R**iding in a group can be exciting and provide you an opportunity to share a great experience with old friends while meeting new ones. Compared to riding alone, you'll need a different set of skills to keep you and your group safe. Here are a few safety tips to ensure everyone has an enjoyable time:

### **Safety briefings**

Successful group rides begin with a short meeting before departure providing detailed information about the adventure. Leaders should provide all riders with maps and information concerning the route of travel, speeds, road hazards and weather, fuel, rest and meal stops. In addition, the ride leader and the sweep and trail riders should identify themselves and demonstrate the proper hand and arm signals. The checklist below provides a useful guide for these meetings:

- Review the destination and route of travel.
- Describe how to handle lane changing and what actions to take if the group gets split up.
- Demonstrate and explain each hand signal and insist everyone use those signals.
- Determine the level of riding experience of any new group members.
- Assign new members to "SLOT" positions until the trail rider is satisfied they can properly handle their bikes.
- Have all riders inspect their bikes to ensure everything is in order. As an extra precaution, have everyone do a quick check of the bikes beside them.

### **Formation makeup**

It's important to maintain a staggered formation to make the group more visible to drivers and allow an adequate safety space around the riders. Also, group riding helps prevent riders from being separated by traffic. To create a staggered formation, lead riders should position themselves in the

left third of the lane with the second rider following at least one second behind and in the right third of the lane. This staggered formation should be copied by the following riders in the group, each alternately taking the left or right third of the lane while maintaining a safe following distance. Because it's possible for a group to become too large, riders can be split into smaller formations of five to seven motorcycles.

### **Traversing intersections**

Intersections are particularly dangerous for riders, as many motorists seemingly fail to notice motorcycles. When turning at intersections protected by traffic signals, groups should proceed either single file or in a tight, staggered formation. At unprotected intersections, riders should proceed individually. The group can reform once everyone has safely negotiated the intersection.

### **Safe passing**

How groups should pass slower traffic depends on the type of road. When there are sufficient multiple lanes—such as on freeways or interstates—riders should pass as a group when directed by the lead rider. On two-lane highways and roads, riders should pass individually when it's safe.

### **Handling roadside emergencies**

Whenever riders require assistance, the group members behind them should stop and provide help. Riders ahead of the incident should continue to the next scheduled stop and wait for everyone to catch up.

Riding with a group can be a great experience if everyone understands the rules and abides by them. Maintaining the integrity of the formation, taking cues from the lead rider and safely operating your bike will allow everyone in the group to enjoy the open road. ◀



## AVIATION

### CH-47



#### CLASS C

D Model

■ The aircraft entered brownout conditions and its front wheels entered a ditch during touchdown, resulting in the front wheels and antennas separating from the aircraft. The crew was able to fly the aircraft to home base.

■ The belly of the aircraft was damaged when it contacted an obstacle during landing in an unimproved landing zone.

### OH-58



#### CLASS A

D(R) Model

■ The aircraft struck wires during flight. The U.S. Army Combat Readiness/Safety Center is currently investigating this accident.

**ARE LEADERS ENSURING POLICIES FOR AREA ALTITUDE RESTRICTIONS AND WIRE AVOIDANCE PROCEDURES ARE ENFORCED?**

### TH-67



#### CLASS A

■ The aircraft contacted the ground after becoming unstable during taxi and subsequently rolled over.

### UH-60



#### CLASS B

A Model

■ A Soldier exited the aircraft prematurely during insertion and fell about 20 feet. He suffered multiple left femur, pelvis and spinal fractures.

**➤ DURING TROOP INSERTIONS, DO SOLDIERS WAIT FOR A PRE-BRIEFED SIGNAL FROM THE AIRCREW BEFORE DEPARTING THE AIRCRAFT?**

#### CLASS C

■ During takeoff, the crew noticed a torque split and that the No. 2 engine rotor RPM had begun to decay. Engine No. 2 locked out and the temperature exceeded 942 C for five seconds. An engine inlet plug was installed.

#### CLASS B

##### L Model

■ The aircraft touched down hard, resulting in structural damage.



#### CLASS C

##### U Model

■ While taking off, the aircraft contacted a flock of birds. The crew remained in the traffic pattern for immediate landing. Damage was discovered to the leading edge of one wing.



#### CLASS C

■ While executing takeoff, the UAS lost link with the ground control station. While attempting to land, the aircraft struck the landing pendant.



#### CLASS B

■ The UAS experienced a cylinder head temperature spike, low RPM reading and rapid descent. The aerial vehicle operator initiated landing procedures, but the UAS contacted the ground, damaging the fuselage, wings and tailboom.

#### CLASS B

■ While in flight, the internal generator of the UAS cut out, causing the engine to stall. The UAS went into a quick descent and the parachute deployed.



#### CLASS C

■ The RQ-11 launched and was conducting night operations. A short time later, the AVO banked the RQ-11 to the left, barely missing a radio tower. The AVO lost connectivity, and the RQ-11 lost altitude and crashed.



#### CLASS B (DAMAGE)

■ An M1A2 was damaged by a fire in the engine compartment.

■ An M2A3 Bradley Fighting Vehicle was damaged when a fire started in the engine compartment. The crew attempted to extinguish the fire but was unsuccessful.

■ An M1127 Stryker was damaged when it overturned while negotiating a turn. The crew initiated rollover procedures and suffered no injuries.



#### CLASS A

■ A Soldier suffered fatal injuries when the HMMWV he was riding in overturned during a convoy movement. The convoy speed was reported as 40 mph. The HMMWV sustained damage but was recovered.

## ARMY AIRCRAFT LOSSES

FY02 to Present  
through September 18, 2007



AH-64A/D	12/48
U/MH-60A/L	8/27
C/MH-47	7/16
OH-58D	11/24

**TOTAL 38/115**

## ARMY GROUND LOSSES

FY02 to Present  
through August 2007



AMV	27/26
ACV	15/9
PERSONNEL INJURY <small>includes weapons handling accidents</small>	50/46
FIRE/EXPLOSION	4/1
PROPERTY DAMAGE	1/0

**TOTAL 97/82**

■ A Soldier was operating a heavy equipment transporter and hauling HET tractors on an M1K trailer when a rear trailer tire blew after striking a guardrail. A fire ensued and destroyed all the vehicles.

## CLASS B

■ A Soldier suffered second- and third-degree burns when a flare went off inside the M1151 he was operating, causing the vehicle to catch fire and run into a ditch. The vehicle was a total loss.

■ A Soldier suffered a permanent partial disability when he was thrown from an all-terrain vehicle. The Soldier was a passenger on the ATV when the driver attempted a U-turn and the vehicle rolled over. The driver was not injured.

■ An M1114 up-armored HMMWV caught fire and exploded due to an unknown maintenance cause. A second explosion followed when ammunition began to cook off. Several sensitive items were destroyed.

■ An M1151 HMMWV was damaged and a Long Range Advanced Scout Surveillance System was destroyed when the vehicle overturned. The Soldier operating the HMMWV had survived to miss an object in the road and overcorrected, causing it to roll over twice. The Soldier was not injured.

■ A Soldier inadvertently fired a flare inside an M1114 HMMWV, causing damage to sensitive items, the vehicle and the communications system.

## Personnel Injury

### CLASS A

■ A Soldier suffered a fatal heat injury while conducting maintenance duties on his tracked vehicle. The Soldier was found unresponsive on the ground. His temperature was recorded at 106 F upon arrival at a local clinic.

■ A Soldier suffered a fatal electrical shock while attempting to repair a compound generator.

■ A Soldier died after suffering a heat stroke during a road march.

■ Two Soldiers were killed and three others injured when the small building they were in collapsed during high winds.

## CLASS B

■ A Soldier suffered major burns to 70 percent of her body when she was engulfed in flames while refueling a generator. Another Soldier was able to pull her away from the generator.

■ A Soldier had three fingers severed by a vehicle engine fan blade while performing maintenance. He was replacing the vehicle's water pump and had started the engine to detect leaks. As he pressed against the pump, it moved and the Soldier's hand struck the fan.

■ A Soldier suffered a spinal injury when he struck a wall head-first during combative training. The injury resulted in the surgical fusion of two of the Soldier's vertebrae.

■ A Soldier suffered injuries to his ankle and foot when an artillery simulator went off while he was conducting battle drill room clearing procedures.

■ A Soldier had part of his thumb amputated when his hand guard came apart while firing a captured Iraqi weapon on the range.

■ A Soldier was injured when an M113 generator being loaded onto a trailer landed on his hand.

■ A Soldier suffered a foot injury while conducting a crew-level mortar firing drill. After a 120 mm mortar system was fired, the base plate bounced and landed on the Soldier's foot, amputating his toes.

## OTHER

### CLASS B

■ A GBOSS satellite system was damaged when the driver of a vehicle backed over one of the guide wires, causing it to fall.

**>> DO YOUR SOLDIERS EMPLOY THE PRINCIPLES OF COMPOSITE RISK MANAGEMENT TO ALL THEIR ACTIVITIES?**





## EXPLOSIVES/FIRE

■ Property was damaged when a fire started in a supply tent and spread to two other nearby tents.

## DRIVING

### POV



#### CLASS A

■ A Soldier was driving his privately owned vehicle with another Soldier when the car left the road and struck a tree. The passenger was fatally injured and the driver hospitalized. Both were wearing their seat belts.

■ A Soldier was driving his POV on a state highway when another vehicle crossed the median and struck the Soldier's vehicle. Neither driver took evasive action or braked before the head-on collision. Although he was wearing his seat belt, the Soldier died from his injuries.

■ A Soldier was driving his POV when his vehicle swerved, left the roadway and overturned. The Soldier, who was wearing his seat belt, was fatally injured.

■ A Soldier was fatally injured when his POV left the roadway and overturned into a ditch. The Soldier, who was not wearing his seat belt, died less than a mile from his residence.

**DO YOUR SOLDIERS  
KNOW THE IMPORTANCE  
OF WEARING SEAT  
BELTS AT ALL TIMES?**

#### CLASS B (ATV)

■ A Soldier was operating an all-terrain vehicle when he lost control and the ATV flipped over on him and broke his left clavicle. The Soldier was wearing his helmet and goggles.

## POM



#### CLASS A

■ A Soldier was fatally injured when his motorcycle collided with an approaching pickup truck. The Soldier was wearing his helmet.

■ A Soldier lost control of his motorcycle while entering a curve and crashed into a guardrail. The Soldier apparently had not fastened the chinstrap on his helmet and it came off after he was thrown from his bike. He was pronounced dead at the scene.

■ A Soldier died when his motorcycle struck the bed of a tractor-trailer that was making a turn. The Soldier was wearing the required PPE and had attended the Army-approved MSF training.

■ A Soldier was operating his motorcycle, accompanied by other riders, when he lost control in a curve and struck a sign on the shoulder of the road. He was pronounced dead at the scene.

■ A Soldier was operating his motorcycle when a sport-utility vehicle entered his lane of travel and collided with him head-on, throwing him from the motorcycle. The Soldier was licensed and wearing a helmet. The driver of the sport-utility vehicle has been charged with vehicular homicide.

■ A Soldier was operating her motorcycle when she lost control and was thrown from her bike. She was transported to a medical facility, where she later died. The Soldier was wearing her helmet and had received MSF training. Speed was not reported as a factor in this crash.

■ A Soldier was operating his motorcycle when he attempted to pass a tractor-trailer and struck a construction cone. The impact threw the Soldier off his motorcycle and

beneath the truck. The Soldier's helmet came off during the accident and he suffered fatal injuries.

■ A Soldier was operating his motorcycle when he lost control, entered oncoming traffic and collided with another vehicle. The Soldier was thrown from his motorcycle and pronounced dead at the scene.

■ A Soldier operating his motorcycle on a highway was killed when he was struck by a vehicle exiting a parking lot.

## PERSONNEL INJURY

#### CLASS A

■ A Soldier was hiking in a state park around dusk when he fell to his death.

■ A Soldier was handling a newly purchased handgun when the handgun inadvertently fired, killing another Soldier.

**DO YOUR SOLDIERS  
UNDERSTAND THAT SAFE  
WEAPONS HANDLING  
PROCEDURES ARE  
VITAL OFF DUTY?**

■ A Soldier was among a group of five Soldiers swimming in a swollen river when he failed to make it to the water's edge and drowned.

#### CLASS B

■ A Soldier was cleaning his garage when he was bitten by a spider and his finger began to swell. The Soldier went for medical treatment the following day, but the swelling and pain eventually worsened and he had to be hospitalized. Upon release from the hospital, the Soldier was given seven days' convalescent leave.

■ A Soldier riding his mountain bike downhill hit a small dip and was thrown over his handlebars. The Soldier landed on his left shoulder, breaking his left collar bone.

# AIRCREW COORDINATION BAND OF BROTHERS



U.S. ARMY

ARMY STRONG.®



U.S. ARMY COMBAT READINESS/SAFETY CENTER  
<https://crc.army.mil>



# BROTHERS

Our Army's strength comes through the concept of being a Band of Brothers. No one stands alone, leaders engage and every person is looking out and taking accountability for the person next to them. This is a concept we must follow on and off duty.

ARMY SAFE  
IS ARMY STRONG

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# DESIGN

Our Army's strength comes through t  
No one stands alone, leaders engage  
taking accountability for the pe

Take the keys and be




U.S. ARMY

ARMY STRONG.™



U.S. ARMY COMBAT READINESS CENTER

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IGNATE!

the concept of being a Band of Brothers,  
e and every person is looking out and  
erson next to them on and off duty.

the designated driver.

ARMY SAFE  
S ARMY STRONG





# BEST PRACTICES BEGIN

The Leader's Corner Web site has recently been reorganized into a single page providing quick and easy access to all the information you need. The goal is to help leaders implement Composite Risk Management, keep their Soldiers in the fight and preserve the combat power. For more information on Leader's Corner, visit the website at <https://crc.army.mil/leaderscorner/> or call 334-255-1234.



U.S. ARMY

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<https://crc.army.mil>

A hand with a pinky finger extended is pointing at a computer monitor. The monitor displays a scene with soldiers in camouflage uniforms in a combat environment. One soldier in the foreground is seen from the back, while others are further back. The background of the entire image is a solid purple color.

# HERE

revised to give leaders at every level  
vital safety information. The site's  
Management processes to help  
combat power of their formations.  
USACRC Web site at  
-2381.

ARMY SAFE  
IS ARMY STRONG